Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_

**Moles & Stoichiometry Study Guide**

**Chapter 10 Practice Problems**: 52, 54, 55, 56, 60, 63, 67, 68, 70, 71, 72, 73, 75, 76, 77, 78, 79, 80, 85, 86, 88, 89, 92

**Chapter 12 Practice Problems**: 44, 45, 46, 47, 49, 50, 53, 54, 58, 61, 62, 70

* Content of chapter 12 reading is fair game!

1. If 3.0 moles of HCl are consumed in the reaction below, how many moles of FeCl3 are produced?

**6 HCl + Fe2O3 🡪 2 FeCl3 + 3 H2O**

* 1. 0.5 mol
  2. 1.0 mol
  3. 2.0 mol
  4. 4.0 mol

1. Given the equation **2 H2O 🡪 2 H2 + O2**, how many moles of H2O would be required to produce 2.5 moles of O2?
2. 2 mol
3. 2.5 mol
4. 4 mol
5. 5 mol
6. If 3.0 moles of CaCO3 decompose, how many grams of CO2 are produced?

**CaCO3 🡪 CaO + CO2**

1. 3 g
2. 44 g
3. 88 g
4. 132 g
5. Given the balanced equation **16 HCl + 2 KMnO4 🡪 2 KCl + 2 MnCl2 + 5 Cl2 + 8 H2O**, how many grams of H2O will be produced if 1 mole of KMnO4 reacts?
6. 9 g
7. 13 g
8. 72 g
9. 144 g
10. How many grams of H2SO4 are required to produce 1 gram of H2?

**Zn + H2SO4 🡪 ZnSO4 + H2**

1. 1.0 g
2. 2.0 g
3. 49 g
4. 98 g
5. Given the reaction **Zn + 2 HCl 🡪 ZnCl2 + H2**, if 2.0 mol Zn and 5.0 mol HCl are allowed to react, then…
6. Zn is the limiting reactant
7. HCl is the limiting reactant
8. 1.0 mol of ZnCl2 is produced
9. 5.0 mol of H2 is produced
10. Once the reaction in question 6 is done, how many moles of excess reactant remain?
11. 3 mol
12. 1 mol
13. 4 mol
14. 2 mol
15. If 50g of CaCO3 decomposes to produce 20g of CO2 in the lab, what is the percent yield of CO2?

**CaCO3** 🡪 **CaO + CO2**

1. 66.7%
2. 40%
3. 90.9%
4. 250%
5. **Ammonia, NH3, is a typical ingredient in household cleaners. It is produced through a synthesis reaction involving N2 and H2.**
6. Balance the equation: \_\_\_\_\_\_\_N2 + \_\_\_\_\_\_\_H2 🡪 \_\_\_\_\_\_\_NH3

N: N:

H: H:

1. List the reactant(s): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. List the product(s): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. If 12.0 moles of H2 react with excess N2, how many moles of ammonia will be produced? This number is your theoretical yield.
4. You carry out the reaction in the lab and produce 7.0 moles of ammonia (NH3). What is your percent yield?
5. **The compound tin(II) fluoride, SnF2, was once a common ingredient in toothpaste. It is produced according to the following reaction:**
6. Balance the equation: \_\_\_\_\_Sn + \_\_\_\_\_HF 🡪 \_\_\_\_\_SnF2 + \_\_\_\_\_\_H2

Sn: Sn:

H: H:

F: F:

1. What is the limiting reactant if 45.0 grams of HF react with 100.0 grams of Sn?
2. How many grams of the excess reactant will be left over at the end of the reaction?
3. Using the limiting reactant that you identified in part b, determine the theoretical yield of SnF2, the once common toothpaste ingredient, in grams.
4. In the lab, you produce 95 grams of SnF2. What is your percent yield?
5. If NH3 reacts according to the following equation, how many grams of NO will be produced from 10.0 grams of NH3 if the percent yield of NO is 80.0%?

**\_\_\_\_\_NH3 + 5 O2 🡪 \_\_\_\_\_NO + \_\_\_\_\_H2O**

1. Calculate the percent yield of Cl2 in the decomposition of hydrogen chloride if 25.8g HCl produces 13.6g of Cl2.

**\_\_\_\_\_HCl 🡪 \_\_\_\_\_H2 + \_\_\_\_\_Cl2**

1. Calculate the mass of water produced from the reaction of 24.0g of H2 and 160.0g of O2. What is the limiting reactant?

**\_\_\_\_\_H2 + \_\_\_\_\_O2 🡪 \_\_\_\_\_H2O**